UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/650,121	08/28/2003	Olvi L. Mangasarian	1061-001US01	5513

28863 7590 10/20/2006		EXAMINER
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ART UNIT	PAPER NUMBER
2129	

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DATE MAILED: 10/20/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	Applicant(s)
Office Action Summary	10/650,121	MANGASARIAN ET AL.
	Examiner	Art Unit	
	Mai T. Tran	2129	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _09/08/2006_.

2a)☒ This action is **FINAL.**   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-57_ is/are pending in the application.

   4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-57_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

   Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

   Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   a)☐ All   b)☐ Some * c)☐ None of:

   1.☐ Certified copies of the priority documents have been received.

   2.☐ Certified copies of the priority documents have been received in Application No. _____.

   3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

   * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO/SB/08)
   Paper No(s)/Mail Date _090806_.

4)☐ Interview Summary (PTO-413)
   Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

A request for continued examination under 37 CFR 1.114, including the fee set forth in

37 CFR 1.17(e), was filed in this application after final rejection. Since this application is

eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e)

has been timely paid, the finality of the previous Office action has been withdrawn pursuant to

37 CFR 1.114. Applicant's submission filed on September 8, 2006 has been entered.

No amendments have been made. No new claims have been added. Claims 1-57 remain

pending in the application and which have been fully considered by the examiner.

CLAIM REJECTIONS - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or
any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and
requirements of this title.

Claims **1-47, 49-50, 52-53, and 55-57** are rejected under 35 U.S.C. § 101 because the

claimed invention is directed to non-statutory subject matter. The claimed invention is not

statutory because it has not been limited to a <u>substantial practical application</u>. Data classification

system is not specified to a given real world task.

The claimed invention must be for a practical application by:

1. transforming (physical thing) **or**

2. having the FINAL RESULT (not the steps) achieve or produce a

useful (specific, substantial, AND credible)

concrete (substantially repeatable/non-unpredictable), AND

tangible (real world/non-abstract) result.

A claim that is so broad that it reads on both statutory and non-statutory subject matter, must be amended, and if the specification discloses a practical application but the claim is broader than the disclosure such that it does not require the practical application, then the claim must be amended.

In the present case, independent claims 1, 16, 31, 52, and 55 are directed to a method, a system, and a computer readable medium in classification. An invention that "defining a linear programming formulation of a support vector machine classifier", "solving an exterior penalty function of a dual of the linear programming formulation to produce a solution to the support vector machine classifier", and "selecting an input set for the support vector machine classifier based on the solution" has no specific purpose or use. Claims that recite a computer that solely calculates a mathematical formula are not statutory.

The Examiner reads the claims carefully to search for limitations to practical applications and finds no final result achieved or produced a useful, concrete and tangible result. The claimed invention of data classification has no real world function and is not statutory.

CLAIM REJECTIONS - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims **1-47, 49-50, 52-53, and 55-57** are rejected under 35 U.S.C. §112, first paragraph because current case law (and accordingly, the MPEP) require such a rejection if a §101 rejection is given because when Applicant has not in fact disclosed the practical application for the

invention, as a matter of law there is no way Applicant could have disclosed *how* to practice the

undisclosed practical application. This is how the MPEP puts it:

> ("The how to use prong of section 112 **incorporates as a matter of law** the requirement of 35 U.S.C. §101
> that the specification disclose as a matter of fact a practical utility for the invention.... If the application fails
> as a matter of fact to satisfy 35 U.S.C. §101, then the application also fails as a matter of law to enable one
> of ordinary skill in the art to use the invention under 35 U.S.C. §112."); In re Kirk, 376 F.2d 936, 942, 153
> USPQ 48, 53 (CCPA 1967) ("Necessarily, compliance with § 112 requires a description of how to use
> presently useful inventions, **otherwise an applicant would anomalously be required to teach how to use a
> useless invention.**") See, MPEP 2107.01(IV), quoting In re Kirk (emphasis added).

Therefore, claims 1-47, 49-50, 52-53, and 55-57 are rejected on this basis.

CLAIM REJECTIONS - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on
> sale in this country, more than one year prior to the date of application for patent in the United States.

Claims **1-57** are rejected under 35 U.S.C. 102(b) as being anticipated by "Finite Newton

Method for Lagrangian Support Vector Machine Classification", by Glenn Fung et al, Data

Mining Institute Report, 02-01, February 2002, hereafter Fung.

Claim 1

A method comprising:

defining a linear programming formulation of a support vector machine classifier (page 3,

paragraph 2, page 4, lines 1-3);

solving an exterior penalty function of a dual of the linear programming formulation to

produce a solution to the support vector machine classifier (page 5, equation (10)); and

selecting an input set for the support vector machine classifier based on the solution (page 5, line 25).

Claim 2

The method of claim 1, further comprising minimizing the exterior penalty function for a finite value of a penalty parameter (page 2, line 5).

Claim 3

The method of claim 1, wherein the linear programming formulation is a 1-norm linear programming formulation (page 4, lines 1-3).

Claim 4

The method of claim 1, wherein the solution is a least 2-norm solution (page 4, line 3).

Claim 5

The method of claim 1, wherein the support vector machine classifier is a linear support vector machine classifier, and selecting an input set includes selecting a set of input features of the linear support vector machine classifier (page 3, line 16).

Claim 6

The method of claim 1, wherein the support vector machine classifier is a nonlinear support vector machine classifier, and selecting an input set includes selecting a set of kernel functions for the nonlinear support vector machine classifier (page 5, line 17).

Claim 7

The method of claim 1, further comprising:

calculating a separating surface based on the input set and the support vector machine classifier (page 5, line 7); and

classifying data using the separating surface (page 5, lines 7-10).

Claim 8

The method of claim 7, further comprising classifying the data into two sets of data using the separating surface (page 4, Figure 1).

Claim 9

The method of claim 7, wherein the separating surface is one of an n-dimensional hyperplane or a nonlinear surface (page 3, line 12).

Claim 10

The method of claim 1, further comprising applying a Newton-based algorithm to solve the exterior penalty function (page 7, equation (17)).

Claim 11

The method of claim 1, further comprising applying one or more linear constraints to the solution of the exterior penalty function (page 6, line 19).

Claim 12

The method of claim 1, wherein selecting an input set includes selecting a subset of input features from a larger set of input features that is substantially larger than the subset of input features (page 14, paragraph 5).

Claim 13

The method of claim 12, wherein the subset of input features includes less than approximately one percent of the larger set of input features (page 14, paragraph 5).

Claim 14

The method of claim 12, wherein the subset of input features includes less than

approximately .1 percent of the larger set of input features (page 14, paragraph 5).

Claim 15

The method of claim 12, wherein the larger set of input features includes more than

20,000 input features, and the subset of input features includes less than ten input features (page

1, abstract).

Claim 46

The method of claim 1, further comprising applying the support vector machine classifier

to classify data relating to one of fraud detection, credit evaluation, gene expression, intrusion

detection, medical diagnosis or medical prognosis (page 13, paragraph 5.1, 5.1.1).

Claim 47

The method of claim 1, further comprising applying the support vector machine classifier

to classify data relating to multiple myeloma (page 13, paragraph 5.1).

Claim 48

The method of claim 1, further comprising applying the support vector machine classifier

to classify data relating to absolute call measurements for multiple myeloma (page 13, paragraph

5.1.1).

Claims 16-30, 49-51, and 55-57, this is a system version of the claimed method discussed

above, in claims 1-15, wherein all claimed limitations have also been addressed and cited as set

forth above.

Claims 31-45 and 52-54, this is a software version of the claimed method discussed above, in

claims 1-15, wherein all claimed limitations have also been addressed and cited as set forth

above.

RESPONSE TO ARGUMENTS

Applicants' arguments filed September 5, 2006 have been fully considered but they are

not persuasive. Specifically, Applicants make the following arguments:

1.   **Rejection of claims 1-57 under 35 U.S.C. § 101 and 35 U.S.C. § 112, 1ST paragraph:**

- Argument 1: *The Examiner's analysis in support of the rejection under section 101
  relies on both legal and factual errors.*
  *In terms of legal error, the Examiner focused on only one aspect of the claimed
  invention rather than the invention as a whole. In particular, the Examiner
  repeatedly noted the presence of the phrase "linear programming" in the claims, and
  characterized it as an abstract idea. However, the Examiner did not properly
  consider whether the claimed invention as a whole is directed to a practical
  application. In particular, the Examiner characterized the claimed invention as a
  manipulation of an abstract idea in the form of a programming formulation. Yet, the
  Examiner ignored the practical application expressed in the claims, i.e., selection of
  an input set for a support vector machine classifier to carry out data classification.*

In this argument, applicants admit the practical application is "selection of an input set

for a support vector machine classifier to carry out data classification." Applicants are reminded

that during patent examination, the claims are given the broadest reasonable interpretation

consistent with the specification. See In re Morris, 127 F.3d 1048, 44 USPQ2d 1023 (Fed. Cir.

1997).

In their broadest reasonable interpretation, the claims can be interpreted to be a computer program per se that merely selects unspecified, abstract, arbitrary input data set for a support vector machine classifier to carry out a mathematical algorithm. Applicants' claims in this case do not provide a "... useful, concrete, and tangible result." It is unclear to Examiner what is the claimed invention relied upon to do in the real world?

Examiner searched the claims, in the most favorable to Applicants, for any statutory material and found none. Examiner then made the rejections in order to provide Applicants an opportunity to provide statutory matter that had not been previously claimed. Applicants failed to provide statutory amendments.

It is Examiner's opinion that the claims are devoid of statutory material. Having been given ample opportunity to respond by amendment, Applicants have presented no statutory limitations to circumscribe the metes and bounds of the claims sufficiently to change this assessment.

Accordingly, the rejections STAND.

- Argument 2: *In addition, the Examiner elevated the requirement of practical application above the level required by the law. In particular, the Examiner stated that the claims do not refer to any substances that are transformed or reduced, nor any specific data representing physical objects or activities. The Examiner concluded that, because "data classification" is not qualified by specific data representing physical objects or activities that are being transformed, the application of the claimed invention is not a practical application. As will be discussed in further detail below, the practical application in this instance is data classification per se, similar to applications for data encryption, encoding, or compression. Specification of the actual data that is classified is not necessary to demonstrate the practical application of the underlying invention.*
  The claimed invention clearly defines a practical application. In so doing, the claimed invention need not physically transform any material or article. Rather, it is sufficient that the claimed invention produce a useful, concrete and tangible result. To that end, the various claims are directed to a method, apparatus, system and

> *article of manufacture useful in data classification. Although the claimed invention may rely in part on mathematical relationships and computing techniques, it presents a practical application of such relationships and techniques to data classification. In refusing to recognize data classification by a support vector machine classifier as a practical application, the Examiner's analysis relies on factual error.*

In this argument, Applicants allege that the Examiner "elevated the requirement of practical application above the level required by the law" and the Examiner "refused to recognize data classification by a support vector machine classifier as a practical application." Applicants are directed to page 13 and page 15 of the Final Office Action dated May 5, 2006 and in this action on page 2 above. Applicants are reminded again and again that to satisfy section 101 requirements, the claims must be for a practical application of the § 101 judicial exception, which can be identified in **various ways**:

- **EITHER** the claimed invention "transforms" an article or physical object to a different state or thing,

- **OR** the claimed invention otherwise produces a useful, concrete, and tangible result (emphasis added).

In contrary to Applicants' allegation, Examiner looked at claims from multiple perspectives, from every possible angle that is favorable to applicant and still found no statutory matter.

In their broadest reasonable interpretation, the claims can be interpreted to be a computer program per se that classifies unspecified, abstract, arbitrary data using a mathematical algorithm. Applicants' claims in this case do not provide a "… useful, concrete, and tangible

result." It is unclear to Examiner what is the claimed invention relied upon to do in the real world? What part of the real world does applicants' data comes from?

Examiner searched the claims, in the most favorable to Applicants, for any statutory material and found none. Examiner then made the rejections in order to provide Applicants an opportunity to provide statutory matter that had not been previously claimed. Applicants failed to provide statutory amendments.

It is Examiner's opinion that the claims are devoid of statutory material. Having been given ample opportunity to respond by amendment, Applicants have presented no statutory limitations to circumscribe the metes and bounds of the claims sufficiently to change this assessment.

Accordingly, the rejections STAND.

- Argument 3: *The subject matter of the claimed invention clearly provides a useful result, i.e., identification of different classes of data within a larger set of data. Data classification may be used in a wide variety of fields including, for example, data mining, medical diagnosis, medical prognosis, fraud detection, intrusion detection, credit evaluation and gene expression.*
The result provided by the claimed invention is also concrete within the meaning of section 101. In particular, the data classification results are concrete in the sense they provide a repeatable, predictable result in classifying data into different classes. Accordingly, there should be no question that the claimed invention provides a concrete result.
Finally, the claimed invention also provides a tangible result. Neither section 101 nor the case law require that, to be tangible, a claim be tied to a particular machine or apparatus or operate to change articles or materials to a different state or thing. On the contrary, the result must be tangible in the sense that the claimed invention provides a practical application.

In this argument, Applicants assert the claimed invention provides a useful, concrete, and tangible result.

First, Applicants are reminded that under 35 U.S.C. 101, applicants are entitled to one patent for one invention. Therefore, data mining, medical diagnosis, medical prognosis, fraud detection, intrusion detection, credit evaluation and gene expression are not just one invention.

Second, the <u>useful</u> result as Applicants argued does not appear as limitations in any independent claims. Applicants must expressly present limitations that, in their broadest reasonable interpretation, denote statutory limitations to <u>A</u> practical application.

Third, the <u>concrete</u> result as Applicants argued is "repeatable, predictable in classifying data into different classes." It is unclear to Examiner how the result can be repeatable and predictable if the input data is unspecified, abstract, and arbitrary.

Fourth, the <u>tangible</u> result as Applicants argued that the claimed invention provides a practical application. Examiner reads the claims carefully to search for actual limitations to practical applications and finds none. It is Examiner's opinion that the claims are devoid of statutory material. Having been given ample opportunity to respond by amendment, Applicants have presented no statutory limitations to circumscribe the metes and bounds of the claims sufficiently to change this assessment.

Accordingly, Applicants have failed to carry their burden of showing how the claims are in any way statutory. On this basis, Examiner finds Applicants' argument to be unpersuasive and the rejections STAND.

- <u>Argument 4:</u> *The claimed invention does not simply manipulate abstract ideas. The fact that the claims recite the use of a linear programming formulation does not mean that the claims merely define an abstract idea. On the contrary, the linear*

> *programming formulation is one aspect of the claimed invention as a whole, which applies the linear programming formulation to produce a reduced input set for use by a support vector machine classifier in classifying data.*
>
> *In particular, the claims require selection of an input set for a support vector machine classifier based on a solution to an exterior penalty function of a dual of a linear programming formulation of the support vector machine classifier. The selection of an input set for a support vector machine classifier is not an abstract idea per se, nor merely a mathematical algorithm in the abstract. Rather, the claimed invention defines a solid technique for data component reduction.*
>
> *As described in Applicants' disclosure, a support vector machine (SVM) classifier is a tool for data classification and is often used for data mining operations. To enhance performance of an SVM classifier, it is desirable to make the input set used to define the separating surface applied by the SVM classifier as small as possible. The input set for an SVM classifier may present thousands, or even millions, of data points, and each data point may consist of hundreds of components. The claimed invention permits suppression of the input set components to substantially enhance the performance of an SVM classifier.*

In this argument, Applicants assert that the "selection of an input set for a support vector machine classifier" is not an abstract idea per se, nor merely a mathematical algorithm in the abstract.

In their broadest reasonable interpretation, the claims can be interpreted to be a computer program per se that merely selects unspecified, abstract, arbitrary input data set for a support vector machine classifier to carry out a mathematical algorithm. Applicants' claims in this case do not provide a "... useful, concrete, and tangible result." It is unclear to Examiner what is the claimed invention relied upon to do in the real world?

Examiner searched the claims, in the most favorable to Applicants, for any statutory material and found none. Examiner then made the rejections in order to provide Applicants an opportunity to provide statutory matter that had not been previously claimed. Applicants failed to provide statutory amendments.

It is Examiner's opinion that the claims are devoid of statutory material. Having been given ample opportunity to respond by amendment, Applicants have presented no statutory limitations to circumscribe the metes and bounds of the claims sufficiently to change this assessment.

Accordingly, the rejections STAND.

- Argument 5: *As mentioned above, identification of the particular type of data classified by the SVM classifier is not necessary to support a practical application. Rather, the practical application of the claimed invention is data classification itself. This is similar to an invention relating to data encryption, encoding or compression. In those cases, mathematical expressions are applied to encrypt, encode or compress data, without necessary regard to the particular nature of the data.*
  The practical application of the claimed invention is data classification, much like the practical application of a data encryption process is encryption, without regard to the type of data that is encrypted. On a similar note, the practical application of a fluid handling device is fluid handling, regardless of the particular type of fluid that is handled. To view the practical application in terms of the type of data that is classified misses this point.

Again, in this argument Applicants erroneously assert the Examiner "views the practical application in terms of the type of data."

Applicants are directed to page 13 and page 15 of the Final Office Action dated May 5, 2006 and in this action on page 2 above. Applicants are reminded **again and again** that to satisfy section 101 requirements, the claims must be for a practical application of the § 101 judicial exception, which can be identified in **various ways**:

- **EITHER** the claimed invention "transforms" an article or physical object to a different state or thing,

- **OR** the claimed invention otherwise produces a useful, concrete, and tangible result (emphasis added).

In contrary to Applicants' allegation, Examiner looked at claims from multiple

perspectives, from every possible angle that is favorable to applicant and still found no statutory

matter.

Examiner searched the claims, in the most favorable to Applicants, for any statutory

material and found none. Examiner then made the rejections in order to provide Applicants an

opportunity to provide statutory matter that had not been previously claimed. Applicants failed

to provide statutory amendments.

It is Examiner's opinion that the claims are devoid of statutory material. Having been

given ample opportunity to respond by amendment, Applicants have presented no statutory

limitations to circumscribe the metes and bounds of the claims sufficiently to change this

assessment.

Accordingly, the rejections STAND.

- Argument 6: *Moreover, even if application to a particular type of data were
  necessary, various dependent claims are even more specific. For example, dependent
  claims 46, 49 and 52 recite application of a support vector machine classifier to
  classify data relating to one of fraud detection, credit evaluation, gene expression,
  intrusion detection, medical diagnosis or medical prognosis. Similarly, claims 47, 50
  and 53 recite applications of a support vector machine classifier to classify data
  relating to absolute call measurements for multiple myeloma, and claims 48, 51 and
  54 recite application of a support vector machine classifier to classify data relating to
  absolute call measurements for multiple myeloma. Clearly, such claims contemplate
  a practical application that yields a useful, tangible and concrete result.
  In the Office Action, the Examiner dismissed the recitation in claims 46-54 as merely
  pertaining to a field of use. Applicant strongly disagrees. If a tangible result
  requires specification of a particular type of data representing physical objects or
  activities, a point which Applicant disputes, then claims 46-54 surely meet such a
  requirement. The Examiner provided no basis whatsoever for his dismissal of such
  claims as being directed merely to a field of use. Yet, qualification of the type of data
  seems to be exactly what the Examiner believes is required for statutory subject
  matter. Therefore, the Examiner's analysis is inconsistent.*

> *If fraud detection, credit evaluation, gene expression, intrusion detection, medical diagnosis or medical prognosis data does not further limit the claimed invention to a particular, practical application, then it is unclear to Applicant what more the Examiner might require. Medical diagnostic data, for example, clearly represents data useful in medical diagnosis and limits the claimed invention to the practical application of classification of medical diagnostic data. Likewise, gene expression data limits the claimed invention to the practical application for classification of gene expression data. Moreover, it is unclear how the Examiner could simply dismiss the additional requirements of claims 47, 50 and 53, which specify the particular application of the support vector machine classifier to classify data relating to absolute call measurements for multiple myeloma. Claims 48, 51, and 54 even further limit the claims to the practical application of classifying data relating to absolute call measurements for multiple myeloma.*
> *The basis for Examiner's dismissal of such limitations as merely representing a field of use is unclear. In particular, Applicant can find no basis in the law for the proposition that a practical application of a claimed invention can be dismissed as a field of use. If this were the appropriate rationale, Applicant questions how the Examiner would distinguish between data relating merely to "dollar amounts," per State Street, and data relating more particularly to absolute call measurements for multiple myeloma, as claimed by Applicant. Applicant respectfully requests that the Examiner cite proper authority to justify his disregard for the practical applications recited in claims 46-54. Absent citation of such authority, the rejection should be withdrawn.*

In this argument, Applicants point out to dependent claims 48, 51, and 54 that cite the limitation "absolute call measurements for multiple myeloma." This argument is found persuasive. Therefore, Examiner withdraws the 101 and 112 1st paragraph rejection of claims 48, 51, and 54.

Regarding the limitations in claims 56, 47, 49, 50, 52, and 53, Applicants are reminded that under 35 U.S.C. 101, applicants are entitled to one patent for one invention. Data mining, medical diagnosis, medical prognosis, fraud detection, intrusion detection, credit evaluation and gene expression are different inventions. Applicants also request the Examiner to cite proper

authority to support for her rejection. Examiner complies with Applicants' request. The

Supreme Court held the following:

> A mathematical formula as such is not accorded the protection of our patent laws,*Gottschalk v.*
> *Benson, supra,* and this principle cannot be circumvented by attempting to limit the use of the formula
> to a particular **technological environment**. *Parker v. Flook, supra.* (Diamond v. Diehr, 450 U.S. 175,
> 209 USPQ 1). (Emphasis added).

Applicants merely limit the use of the algorithm to a "technological environment" i.e.

field of use. Applicants have not provided limitations to practical applications in that

"technological environment." Applicants must understand that claims are not just words listing

out invention elements...they are limitations that define the fundamental claim scope.

Summarizing all this by restating what the Federal Circuit held: 'Claims should be

evaluated by their limitations, not by what they incidentally cover." See, In re Warmerdam, 31

USPQ2d 1754, 1759 (Fed. Cir. 1994).

Applicants assert that their claims are statutory based on mere incidental coverage of the

claims...not specific claim limitations. Applicants did not claim the practical applications they

assert in their argument. Applicants simply left their claims unlimited and abstracted from any

particular practical application while citing incidental matter as possible claim interpretations, as

opposed to actually presenting claim limitations denoting the practical application(s).

Examiner searched the claims, in the most favorable to Applicants, for any statutory

material and found none. Examiner then made the rejections in order to provide Applicants an

opportunity to provide statutory matter that had not been previously claimed. Applicants failed

to provide statutory amendments.

It is Examiner's opinion that the claims are devoid of statutory material. Having been

given ample opportunity to respond by amendment, Applicants have presented no statutory

limitations to circumscribe the metes and bounds of the claims sufficiently to change this

assessment.

Accordingly, the rejections STAND.

- Argument 7: *Applicant respectfully submits that the Office Action seems to place undue emphasis on the presence of a linear programming formulation in the claims, and overlooks the application of the linear programming formulation in reducing the input set components for a support vector machine classifier to enhance data classification performance. Upon realization that the claimed invention is not directed to an abstract idea per se, but rather a practical application of mathematical relationships to perform data classification, it should be clear that the claimed invention defines statutory subject matter under section 101.*

Applicants are directed to page 13 and page 15 of the Final Office Action dated May 5,

2006 and in this action on page 2 above. Applicants are reminded **again and again** that to

satisfy section 101 requirements, the claims must be for a practical application of the § 101

judicial exception, which can be identified in **various ways**:

- **EITHER** the claimed invention "transforms" an article or physical object to a

  different state or thing,

- **OR** the claimed invention otherwise produces a useful, concrete, and tangible result

  (emphasis added).

In contrary to Applicants' allegation, Examiner looked at claims from multiple

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given ample opportunity to respond by amendment, Applicants have presented no statutory

limitations to circumscribe the metes and bounds of the claims sufficiently to change this

assessment.

Accordingly, the rejections STAND.

- Argument 8: *As mentioned in the previous response, the Examiner has identified a number of U.S. patents with claims relating to data classification. Two examples are U.S. Patent Nos. 6,112,195 and 6,134,344, both to Burges, which include claims relating to the use of data classifiers such as support vector machines. Claim 1 of the '195 patent, for example, recites incorporating a local invariance in such a way that a resulting dimension of each feature vector in a kernel-based classifier system (e.g., a support vector machine) is fixed and that the dimension is equal to the dimension of input data minus the number of degrees of freedom in the local invariance, wherein the input data is of dimension N and the provided data is of dimension M, where M>N. The invention claimed in the '195 patent to Burges certainly makes use of mathematical relationships. Like the invention claimed by Applicant, however, the Burges invention is directed to the practical application of such relationships to a data classifier.*
In reply, the Examiner stated that "[a]ll patents issued stand on their own merits and are not subject matter for justification of allowance in other applications." The Examiner further stated that the "justification for allowance of applications is found in current statuses [sic], appropriate case law and USPTO policy." Yet, Applicant contends that the identified patents represent the proper current analysis represents a misinterpretation of the law and a misconception of the requirements for a practical application. As specified by the law, and evidenced by the identified patents, practical application is not a matter of physical transformation, but rather consequence of the invention in the real world.
Data classification has value in the real world and is not a mere abstract idea. The claimed invention is not directed to a linear programming formulation applied to abstract numbers, but rather to the practical application of selecting an input set for a support vector machine classifier for data classification. The selection of an input set for a support vector machine classifier is not an abstract idea per se, nor merely a mathematical algorithm in the abstract.

Examiner is not permitted to comment on allowed patents.

On a general point, Examiner will say that allowed patents are not court cases and,

therefore, do not have any stare decisis value. Further, regardless of what a patent says, it cannot

be read to permit anything outside the scope of what The Federal Circuit, The Supreme Court,

and Congress permit. Examiner does not make statutes or case law...neither do Applicants. It is

our job to obey the law as it is written.

Applicants' argument merely depends on what they perceive caused the allowance of

other patents and is, thereby, unpersuasive. Accordingly, the rejections of the claims STAND.

2.   Rejection of claims 1-57 under 35 U.S.C. § 102(b):

- Argument 1: *Fung does not disclose the use of a linear programming formulation of a support vector machine classifier.*

In this argument, Applicants request the Examiner to provide further explanation

concerning the interpretation of Fung regarding the limitation a linear programming formulation.

Applicants' specification on page 9, paragraph [0037] discloses as follows:

In a linear programming formulation of the standard SVM in equation (2), the term $\frac{1}{2}w'w$ is replaced by $\|w\|_1$, which is twice the reciprocal of the ∞-norm distance between the bounding planes of equation (3).

Fung teaches a linear programming formulation of a support vector machine classifier

(page 3, paragraph 2, page 4, lines 1-3), solving an exterior penalty function of a dual of the

linear programming formulation to produce a solution to the support vector machine classifier

(page 5, equation (10)), and selecting an input set for the support vector machine classifier based

on the solution (page 5, line 25).

- Argument 2: *Fung does not suggest a computer-readable medium storing instructions
  to cause a processor to perform such functions, as recited in claims 31-45 and 52-54.*

Fung does suggest a computer-readable medium storing instructions to cause a processor

to perform such functions, as set forth in claims 31-45 (abstract).

- Argument 3: *Fung also lacks any teaching that would have suggested a classification
  system comprising a processor that applies a linear programming formulation of a
  support vector machine classifier to classify data based on an input set, and an input
  module that generates the input set based on a solution of an exterior penalty function
  of a dual of the linear programming formulation, as defined by claims 16-30 and 49-
  51.*

Fung teaches a classification system comprising a processor that applied a linear

programming formulation of a support vector machine classifier (page 3, paragraph 2, page 4,

lines 1-3) to classify data based on an input set, and an input module that generates the input set

based on a solution of an exterior penalty function of a dual of the linear programming

formulation , as defined by claims 16-30 and 49-51 (page 5).

CONCLUSION

All claims are drawn to the same invention claimed in the application prior to the entry of

the submission under 37 CFR 1.114 and could have been finally rejected on the grounds and art

of record in the next Office action if they had been entered in the application prior to entry under

37 CFR 1.114. Accordingly, **THIS ACTION IS MADE FINAL** even though it is a first action

after the filing of a request for continued examination and the submission under 37 CFR 1.114.

See MPEP § 706.07(b). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

CORRESPONDENCE INFORMATION

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mai T. Tran whose telephone number is (571) 272-4238. The examiner can normally be reached on M-F 9:00am-- 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Vincent can be reached on 571-272-3080. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent

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like assistance from a USPTO Customer Service Representative or access to the automated

information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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